

Claims

1. Concrete comprising PUR.
2. Concrete according to claim 1 comprising a binding agent, water and PUR.
3. Concrete according to claim 1 or 2 wherein the PUR is PUR foam.
4. Concrete according to claim 2 or 3 wherein the binding agent is cement.
5. Concrete according to claim 2 or 3 wherein the binding agent is gypsum.
6. Concrete according to any preceding claim wherein the concrete further comprises at least one bulking agent, waterproofing agent and/or flowing agent.
7. Concrete according to claim 6 wherein the bulking agent is limestone dust.
8. Concrete according to claim 6 wherein the bulking agent is silica sand.
9. Concrete according to any of claims 6 to 8 wherein the waterproofing agent is Hydrophobe.
10. Concrete according to any of claims 6 to 9 wherein the flowing agent is an air entrainer.
11. Concrete according to any of claims 6 to 9 wherein the flowing agent is a plasticiser.

12. Concrete according to any of claims 6 to 11 wherein the concrete comprises:

cement	240-450 kg/m ³
PUR	200-395 kg/m ³
Bulking agent	0-300 kg/m ³
Waterproofing agent (Hydrophobe)	0.1-0.3% w/w cement
Flowing agent (Airalon)	0.03-0.06% w/w cement
Water	160-450 l/m ³

13. Concrete according to claim 12 wherein the concrete comprises:

Cement	375 kg/m ³
PUR	250kg/m ³
Bulking agent	250kg/m ³
Waterproofing agent (Hydrophobe)	0.1-0.3 w/w cement
Flowing agent (Airalon)	0.03-0.06% w/w cement
Water	200 l/m ³

14. Concrete according to claim 12 wherein the concrete comprises:

Cement	300kg/m ³
PUR	327kg/m ³
Waterproofing agent (Hydrophobe)	0.1-0.3% w/w cement
Flowing agent (Airalon)	0.03-0.06 w/w cement
Water	373 l/m ³

15. A construction element comprising concrete according to any of claims 1 to 14.
16. A method for preparing dried expanded PUR for use in the preparation of concrete, comprising:
 - a) soaking granulated PUR foam in water for a period of time sufficient to allow the PUR to expand;
 - b) separating the PUR from the water; and
 - c) drying the PUR.
17. A method according to claim 16, wherein the water is between pH 6 and pH 9.
18. A method according to claim 17, wherein the water is potable.
19. A method according to claim 16, 17 or 18 wherein the PUR is soaked in water for between ten minutes and two days.
20. A method according to claim 19 wherein the PUR is soaked in water for between 1.5 and 2.5 hours.
21. A method according to claim 20 wherein the PUR is soaked in water for about 2 hours.
22. A method according to any of claims 16 to 21 wherein the expanded PUR is dried by standing in air.
23. A method according to any of claims 16 to 21 wherein the expanded PUR is dried by forcing air past it.
24. A method according to claim 22 or 23 wherein the air is heated.

25. A method according to any of claims 16 to 24 wherein the expanded PUR is dried under pressure.
26. A method according to any of claims 16 to 25 further comprising a step to determine the water content of the dried PUR.
27. A method according to any of claims 16 to 26 wherein the PUR comprises recycled PUR foam.
28. A method according to claim 27 wherein the PUR is previously prepared from PUR foam chunks also containing impurities such as aluminium and/or other plastics material.
29. A method according to claim 28 wherein the PUR foam chunks are granulated and the impurities removed.
30. A method according to claim 29 wherein the PUR foam chunks are granulated using a granulator.
31. A method according to claim 29 wherein the PUR foam chunks are granulated using high pressure water jets.
32. A method according to claim 31 wherein the water jets are pressurised at between 10.35 and 48.25 MPa.
33. A method according to claim 32 wherein the water jets are pressurised at about 20.7 MPa.
34. A method according to claim 29 wherein the chunks are granulated by adding water and mixing in a high shear mixer.

35. A method according to claim 34 wherein the mixer operates at between 2000 and 6000 rpm.
36. A method according to claim 35 wherein the mixer operates at about 4000rpm.
37. A method according to any of claims 29 to 36 in which the impurities are removed by passing the granulated PUR foam through a mesh screen.
38. A method according to claim 37 in which the mesh screen is of between 75 μm and 4750 μm gauge.
39. A method according to claim 38 in which the mesh screen is of about 2360 μm gauge.
40. Dried expanded PUR obtainable by a method of any of claims 16 to 39.
41. A method for preparing a building material comprising mixing a binding agent and water with dried expanded PUR according to claim 40.
42. A method according to claim 41 wherein the binding agent is cement.
43. A method according to claim 41 wherein the binding agent is gypsum.
44. A method according to any of claims 41 to 43 wherein the method further comprises mixing at least one bulking agent, waterproofing agent and/or flowing agent with the other components of the mix.
45. A method according to claim 44 wherein the bulking agent is limestone dust.
46. A method according to claim 44 wherein the bulking agent is silica sand.

47. A method according to any of claims 44 to 46 wherein the waterproofing agent is Hydrophobe.
48. A method according to any of claims 44 to 47 wherein the flowing agent is an air entrainer.
49. A method according to any of claims 44 to 47 wherein the flowing agent is a plasticiser.
50. A method according to any of claims 44 to 49 wherein the components of the mix are present in the quantities:

Cement	240-450 kg/m ³
PUR	200-395 kg/m ³
Bulking agent	0-300 kg/m ³
Waterproofing agent (Hydrophobe)	0.1-0.3% w/w cement
Flowing agent (Airalon)	0.03-0.06% w/w cement
Water	160-450 l/m ³